MACROECONOMIC FACTORS AFFECTING THE LEVEL OF CORRUPTION IN COUNTRIES

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Abstract

Corruption is motivated for a lot of factors from different origins. This work researches and analyses which macroeconomics factors are affecting at levels of corruption in countries. Firstly, the main factors that could to have relationship with the levels of corruption have been identified. Later, some factors of them were selected and were tested empirically, through a logit regression. The results of this research show there are empirical evidence in the relationship between three macroeconomics factors and corruption level. In conclusion, corruption is significantly correlated with the transparency, political stability and foreign direct investment. Therefore, to combat corruption in the countries, the Governments need to focus on improving these factors.

Keywords: Corruption, transparency, macroeconomics factors, logit regression and empirical evidence.

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INTRODUCTION

The corruption is defined as the action and effect of corrupting. This is linked to the fact that a person performs an action for personal benefit, and that this harms the interests of society in general. Nevertheless, the concept of corruption may be ambiguous in some respects. According to Soto (2003), corruption varies depending on the country or jurisdiction concerned. Because depending on the legislation, moral and ethical codes, or its political system, the same act can be considered corrupt in one country and not in another.

In addition, according to Meny (1996), contemporary corruption can be explained in two stages. The first stage is included in the period from the mid-twentieth century until the 80s, and the second stage is included in the period from the 80s to the present day. Social scientists maintain that corruption has always existed, what has changed in recent decades is the attitude of politicians and citizens towards this. Nowadays, the term corruption appears both in political debates and social discussions among the citizenry. One of the variables that has encouraged this change in attitude is the transparency of information media, especially in countries where freedom of expression of individuals and media independence are ensured by law. In view of these circumstances, this stage is known as "grand corruption", because it is better known by the population.

Currently, corruption is a phenomenon that affects most countries around the world, both developed and underdeveloped. So, it is an important problem at international level, that needs global solutions from politicians and governing authorities of each country. Generally, democratic countries are less exposed, because these have a greater level of transparency in their governments, but this also means that corruption in these countries adopts subtler and complex forms, to make it more difficult to detect. Therefore, social scientists suggest that corruption affects all countries, both the poor and the rich (Soto, 2003).

The most common forms taken by corruption, regardless of the country in question, according to La Porta (1997), are as follows:

- Bribery.
- Extortion.
- Agreements between public and private agents, where the private agent is favoured by the public sector, in return for a reward to public agent.
- Embezzlement and fraud.
- Financial Speculation with public funds, where these resources are used to invest in the financial market.
- Partiality in the application of laws, in the public administration or any kind of deliberate decision.
- Private collusion in public contracts and tenders, where the participants agree the minimum levels for the public auction.
- Use of inside information to make private economic or social decisions.

Corruption has a negative impact on States that suffer from it. These impacts are various, from economic effects to social effects and humanitarian aid. Moreover, there is a strong correlation between corruption and poverty, so the combating thereof has become the primary objective of many countries, also increasing the importance of preventing rather than curing. Many researchers in the field suggest that the most important preventive measures are: transparency of institutions to the use of public resources, greater independence of the media, and complete independence between the executive and legislature. In this context, one of the ways to combat and prevent corruption is transparency, becoming a key tool for all States.

On the one hand, corruption leads to economic inefficiency, because it causes the loss of opportunities, the poor decision making of public projects and the delay of those which are important to citizenship. On the other hand, corruption incites the reduced investment in education and discourages foreign investment, as investors prefer to invest in countries that have lower levels of corruption (Mauro, 1995).

This can be explained by the bribes received by public officials. These bribes are paid by private companies who want to be hired to make public projects, causing the contractors are not hired because they are more efficient, but because they have been bribed. Additionally, all this encourages to the efficient contractors to enter the game of fraudulent practices. These bribes cause the cost to increase and decrease the quality of public projects, having a negative impact on the quality and productivity of public expenditure (Soto, 2003).

In conclusion, corruption increases the inadequate distribution of public revenues, so that governments charge higher taxes and reduce public expenses. In many countries this translates into spending cuts in education and health, hurting the countries society that suffers the most. In addition, this also produces a political shock, due to the citizens losing their confidence in political representatives, thus producing political crises, seriously damaging the democratic values.

The main goal of this research is to analyse the macroeconomic factors that are directly affecting the levels of corruption in a sample of countries. As has already been seen, corruption has a negative impact on the countries that suffer from it, and reducing its impact is the main objective of many States. Therefore, it is very important to know what is behind it, knowing which are the variables that reinforce and diminish the levels of corruption.

Firstly, the possible explanatory factors of corruption will be identified through a review of the existing literature of various authors. Then, it will be tested empirically to see to what extent it affects the levels of corruption. To that end, a sample of counties will be taken and a quantitative methodology will be applied, with the objective of determining the causal relationships of the results obtained in an econometric regression.

The first section of this document introduces the concept of corruption and its implications, its economic impact and the goal of the investigation. After that, a review of the existing literature will be worked, where the motives of corruption and macroeconomic factors that might be affecting the levels of corruption will be identified. In the third part, empirical evidence will be tested to evaluate if there is macroeconomic factors are affecting the levels of corruption of the countries in the sample. In this part, will discuss about the sample, variables and the indicators used to measure these, the material used and the econometric analysis of the data. In the fourth section, is regarding results obtained and their interpretation. Finally, the findings and conclusions that have been arrived to will be explained.

REVIEW OF THE LITERATURE

THE REASONS FOR CORRUPTION

Bengovic (2005) points out that, the action that causing corruption has to have an advantage over the individual or group performing the task. In other words, the corrupt, both public and private agent has to make a profit from the corrupt act. So the motive is profit, and profit can take different forms, usually these are:

- Economic reason: When a person performs a corrupt act in exchange for economic benefit, either cash or luxury goods such as expensive jewellery.
- Not economic reason: When the person performs a corrupt act in exchange for favourable treatment by another individual.

Moreover, the same author identifies three types over deeper motivations, as the following:

- When a citizen or a private company bribes a public official to get a right faster than another person. For example, a citizen bribes an official to get faster service, but this service is completely legal. So, both the citizen or company and the official are committing a corrupt act, since the official will receive some favour or a financial reward for performing the requested action. This is possible when there is little supervision by the State to its public officials, and they can act deliberately.
- When the purpose of bribe to the public official is to obtain a non-legal service, which is called administrative corruption. The reasons why this corruption is carried out to achieve a privilege that the law does not allow. For example, when a company or citizen are bribing a public official to receive public grants that really do not apply to them. As noted in the above example, this is due to a lack of supervision and legality of public administrative activity.
- When corruption is focused on changing the regulations to favour of corrupt individuals, this is known as "state capture". For example, when a citizen or company are bribing a public official in order to build on undeveloped land. These acts lead to the public legislator changes the regulation to favour the interests of corrupt in exchange for a reward. Consequently, these public policies are not formulated to meet the needs of society, if not to a few corrupt agents.

In addition to these reasons, there are a number of personal factors amongst corrupt persons that encourages to committing fraudulent acts, and these were set by Donald Cressey, the model known as the "fraud triangle" (Lopez and Sanchez 2012).

The three personal factors that drive an individual to perform fraudulent acts are the following:

- Power: This factor refers to the incentive or pressure that a worker receives, public or private, in his job to commit fraud. The fraudster must obtain a private gain to do the act.
- Opportunity: This factor refers to the existence of circumstances that facilitate the realization of fraudulent acts. In turn, these circumstances will be motivated by lack of mechanisms control, or the inefficiency of these if they exist.
- Rationality or attitude: This is a subjective factor, as it is subject to fraudster profile and it is relating to the ethics of each person. Employees who associate the fraudulent act as something not dishonourable, will have more reason than the rest to commit it.

MACROECONOMIC FACTORS THAT MIGHT BE AFFECTING THE LEVELS OF CORRUPTION UNDER STUDY IN THE EMPIRICAL ANALYSIS

In this part, macroeconomic factors that may be affecting corruption levels will be identified and explained, based on literary and empirical studies of various expert authors on the subject, reviewed in this paper. Further, will pose the hypotheses to be tested in the empirical analysis.

- **Accountability (transparency):** Both vertical accountability and horizontal, have an influence on levels of corruption. The vertical accountability is between the government and citizens, while horizontal accountability is between the three branches of government (legislative, executive and judicial). The argument that this variable affects the levels of corruption is the following: A greater control of the executive by the legislature and judiciary, results in citizens and investors having greater confidence in in the State. In addition, control of the branches of government and their transparency to reduce corruption.

  Prats (2008) focuses his empirical analysis on testing this variable, analysing the extent to which corruption (dependent variable) is determined by the control between branches of government. The methodology applied is to use two indicators of corruption, the perception of corruption developed by Transparency International, and the other one from the World Bank Institute by various researchers, using a methodology unobserved components from surveys conducted by more than fifteen different sources. The independent variable collects the political constraints, and independent variables are the logarithm of GDP per capita and primary enrolment. The sample is made by OECD countries, some countries in Africa, Asia, Latin America, and the ancient Spanish, French and English colonies. The conclusion reached by the empirical analysis is that the controls between branches of government significantly reduce levels of corruption, so there is empirical evidence to prove the significance of this variable on the level of corruption in a country.

  This conclusion is also supported by Kaufmann (2000), which argues in his literary study, that in countries where there is greater independence and impartiality of the judiciary, are less exposed to corruption, since courts have the capacity and independence enough to resolve legal disputes related to corruption.

Hypothesis 1: A higher level of transparency in a country will be associated with lower level of corruption in this country.

- **Political stability:** Countries with greater political stability are associated with a lower level of corruption than countries with instability, because in a stable context both citizens and political representatives will have less tolerance for corrupt actions in the public and private sector, because these actions can damage the citizens trust in their representatives.

  This variable is supported by Bigio and Ramirez-Rodan (2006) in their empirical review. This review presents evidence of the relationship between corruption and a series of development indicators. The sample consists of 209 countries, and the methodology used is to make relationships between the corruption indicator consists of eight different surveys on corruption, with each independent variable to test.

  Hypothesis 2: A greater political stability in a country will be associated with lower level of corruption in this country.
- **Educational level:** This variable is important because it is assumed that people with more education are less permissive with corrupt practices and this means that they are less likely to break the law. This theory implies that people with more education are less exposed to the action of improper use of public resources for their own benefit, as they have received an education in many cases subsidized by the state, and corruption adversely affects public spending in education. This variable is cited in the empirical study of Prats (2008). There is also empirical evidence that shows this relationship, since it is supported by empirical review of Bigio and Ramirez-Rodan (2006).

  Hypothesis 3: A higher level of education in a country will be associated with lower level of corruption in this country.
- **Culture of illegality:** This refers to the existence of social tolerance towards private privileges, since societies that have well accepted private enrichment through illegal acts are much more exposed to corrupt acts than societies with a culture of law and civil morality. This variable is argued by the literary study of Soto (2003).

  Hypothesis 4: A greater the culture of illegality in a country will be associated with higher level of corruption in this country.
- **Foreign direct investment (FDI):** Countries with more foreign investment present in their economy will pay more attention to controlling corruption, because corruption in a country causes distrust of investors when investing in

that country. So, countries with less foreign investment, will be deemed as less important to investors, and will be exposed to higher levels of corruption. There is empirical evidence that shows this relationship, and it is supported by the empirical review of Bigio and Ramirez-Rodan (2006).

Hypothesis 5: A greater foreign direct investment present in a country will be associated with lower level of corruption in this country.

- **Tax burden:** The countries with a highest tax burden will be more exposed to corruption, since a large tax burden can be motivation to tax evasion, while the countries with the lowest tax burden will have less of an incentive of committing unlawful acts, such as not paying their taxes to the state coffers. In addition, countries that penalize less tax defaults, are encouraging tax evasion. There is empirical evidence that shows this relationship, as it is supported by the empirical review of Bigio and Ramirez-Rodan (2006).

  Hypothesis 6: A higher tax burden in a country will be associated with higher level of corruption in this country.

- **Inequality:** Countries with less corruption control have greater diversion of funds toward wealthy sectors of the population than to the poorest population. This is because, countries with greater inequality have higher concentration to the rich agents, and they will commit fraudulent acts to continue maintaining their social status. There is empirical evidence that shows this relationship, as it is supported by the empirical review of Bigio and Ramirez-Rodan (2006).

  Moreover, Alcaide and Larrú (2007) focus their empirical analysis to test this variable, analysing the extent to which corruption is influenced significantly by inequality and poverty in a country. The methodology used in the analysis is to use two indicators of corruption (one of them prepared by the World Bank and the other one prepared by Transparency International), two indicators of development (the Human Development Index and per capita income), an indicator of poverty (the human poverty index) as an indicator of inequality and the Gini coefficient. The sample was composed of 165 countries considered as representative of the world. The conclusion reached with the results of the empirical analysis it is that corruption is negatively associated with inequality, that is, the greater the inequality the greater the corruption exist in a country.

  Hypothesis 7: A greater inequality in a country will be associated with higher level of corruption in this country.

- **Income level:** Countries with higher income levels will be presented lower levels of corruption, since individuals with high purchasing power will not have the same needs as individuals with lower purchasing power to take unfair advantage of

public resources for personal gain. This variable is examined in the empirical study of Prats (2008) and demonstrated by the results of empirical analysis of Alcaide and Larrú (2007), in which they tested that corruption levels are correlated with per capita income, proving empirically that a higher per capita income is correlated with lower corruption levels.

Hypothesis 8: A higher level of income in a country will be associated with lower level of corruption in this country.

OTHER MACROECONOMIC FACTORS THAT MIGHT BE AFFECTING THE LEVELS OF CORRUPTION

In this part, will identify and explain what other macroeconomics factors that may be affecting corruption levels, based on literary and empirical studies of various expert authors on the subject, reviewed in this paper. These factors will be out of reach of empirical analysis.

- **The market regulation by the State**: On the one hand, this causes public agents to have increased decision-making power in their hands, and on the other hand, that private actors might be forced to carry out illegal practices to acquire influence of the economy. This variable is pointed by the literary study of Soto (2003). Furthermore, this argument is supported by other authors, as the example of Kaufmann (2000), which argues that the degree of state involvement in the economy is related to the level of corruption in the country, since excessive regulation of business private sector and high taxes, drive a higher incidence of corruption.
- **The salaries of civil servants**: There are reasons to argue that in countries where the income of civil servants are low there is more corruption, due to the officials doing malpractices to get a bonus in their salary to meet their income needs. This variable is pointed out by the literary study of Soto (2003).
- **Quality of public administration:** This quality prevents corrupt acts being carried out, as there are mechanisms of control and supervision of the actions of public officials. Private agents will not be so exposed to corrupt actions if the administrative system is efficient. In contrast, in countries where the quality of administrative services is low, agents will be tempted to bribe government officials to obtain greater efficiency of services. This variable is proposed by the literary study of Soto (2003).

- **Citizen Political Participation:** This variable is signalled because in countries with a higher degree of citizen participation, democratic countries, there is a greater sense of general wellbeing, where corruption is less tolerated, since this adversely affects the social welfare state. While in non-democratic societies, there is more tolerance to corruption, due to there being no sense of general wellbeing, and corruption can be understood as individual enrichment that everyone pursues. This variable is marked by the literary study of Soto (2003). Moreover, this argument is supported by the literary study of Kaufmann (2000), which argues that there are political determinants, such as fundamental rights and civil liberties of citizens of a country, which are the key to explaining. The corruption variable as countries that have stronger political rights, accompanied by civil liberties, have less corruption. Since citizens have influence on the political power of the country and elect political representatives who are not involved in corruption.

METHODOLOGY

VARIABLES AND INDICATORS

In this section, the target study variables will be described and as will the indicators that have been used to describe them. Table 1 shows the summary of the variables and indicators, as well as showing the source of such data which has been collected.

Dependent Variable:

The **dependent variable is corruption**. To measure this variable, the **'Perceptions Index Corruption'** (CPI) 2015 is taken as an indicator. The index was created in 1995 by Transparency International (TI), a non-governmental organization devoted to combating corruption, both the public sector and the private, and trying to bring together a global coalition of governments. The CPI is a composite indicator that measures the perception of corruption in the public sector in 168 countries. In addition, this index is standardized, allowing the comparison of levels of perception of corruption among different countries and compare between different points in time. The data sources are prepared on a scale of 0 to 100, where 0 is the highest corruption perception level, and 100 is the lowest level.

Independent and control variables:

After reviewing literature and empirical studies on the subject, potential macroeconomic factors that influence levels of corruption have been converted into independent variables in this study and are presented below, structuring them in the following way:

- **Independent variables** that are taken into account when making the empirical analysis of this paper, are those that are used to measure the effects they have on the levels of corruption in the countries that form the sample.
- **Control variable**, which is an independent variable, but not handled in the empirical analysis and are remaining constant to neutralize their effects on the dependent variable.
- **Independent variables out of reach of empirical analysis** of this paper, but it would be desirable to study the relationships of these variables with the levels of corruption in future work in this area. These variables may be affecting the levels of corruption, but are beyond the empirical analysis due to lack of availability of data in some of the countries that make up the sample.

The **independent variables** and indicators that will be taken to reference them are the following:

- **The explanatory variable that collects state transparency** will be measured by the ranking of the right to information, known as ranking of transparency, because it evaluates soundness of the legal framework of a country to guarantee the right to information. This ranking evaluates the legislative framework; it does not evaluate proper implementation or enforcement. The data obtained from this index are from 2013, since it is the most recent data.

  This index was developed by Access Info Europe and the Centre for Law and Democracy. The methodology used to create this ranking was done by analysing 61 indicators that were awarded scores between 0 and 2, a sample of 100 countries around the world; so the final index takes a value of 0 when there is no transparency in the state, and 150 if there is perfect transparency.

  In addition, inside this ranking are not all countries that form the sample of this work, the large majority of them are African countries. Therefore, starting with the assumption that countries that are not included in the ranking will take a value 0, since if not found in the ranking is because their states are not transparent.
- **The explanatory variable that collects political stability** will be measured by the Index of Political Stability in 2014, and is qualified between -2.5 (weak political stability) and 2.5 (strong political stability). This index includes components such as the risk of military coup in a region, rebellions, political terrorism, civil war, armed conflict, and climate of instability that offers foreign investors among others. The sample of this index is made up of 200 countries worldwide and is prepared by the World Bank, although data has been extracted from another source.
- **The explanatory variable that collects the culture of illegality** will be measured through a ranking by the World Bank in 2015, in which a score is given to countries on fulfilling their contracts. Scores can range from 1 to 189; 1 is the highest score (the country meets all contracts) and 189 the lowest score (the country does not comply with all contracts).

  This indicator measures the time and cost to resolve a commercial dispute through the Regional Court of First Instance, also introduces an index on the quality of the judicial process, which assesses whether each of the economies in the sample, formed by 189 countries around the world, has adopted a series of best practices that promote quality and efficiency in the judicial system. Data was

collected through study of the codes of civil procedure and by questionnaires duly completed by trial lawyers and local judges.

- **The explanatory variable that collects educational level** will be measured by various indices, but for this research is going to take the enrolment in secondary level. The gross enrolment rate in secondary school corresponds to the total number of students enrolled in secondary education, regardless of age, expressed as a percentage of the total population of official secondary school age. This rate may exceed 100% due to the inclusion of older and younger students at the official age, because there are students that repeat grades or early or late entry at that level of education.

  The data obtained for this work are of the year 2014. However, in those countries in which the sample has no existing data for that year, takes instead figure from the previous year.
- **The explanatory variable that collects foreign direct investment** will be measured by the percentage of GDP. Foreign direct investment is the net inflow of investment in a country to obtain a long lasting control in the management (usually 10% or more of the shares which carry voting rights) of companies in that country. This index reflects net inflows in the economy divided by GDP.

  As this variable is very volatile and suffers significant fluctuations from one year to another, in some countries of the sample, it will take the average of the data from years 2012, 2013 and 2014.
- **The explanatory variable that collects the tax burden** on the citizens of country will be measured by the percentage of GDP that represents the tax revenue, and these are composed of compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, sanctions, and most social insurance contributions are excluded. Refunds and corrections of erroneously collected tax revenue are considered negative income.

  The data obtained for this work are of the year 2014. However, in those countries in the sample that has not data for that year, the figure from the previous year I taken instead.
- **The explanatory variable that collects income levels** will be measured by GDP per capita, expressed in dollars at current international prices. The GDP per capita, or income per capita, is the relationship between GDP and the number of inhabitants of a country. GDP by purchasing power parity (PPP) is gross domestic product converted to international dollars using rates of purchasing power parity. This indicator is used because it is in the best position to estimate the wealth of the population of a country, and this is directly related to the quality

of life of the inhabitants of a country. However, this index does not take into account the income inequality, however there is another index that measures it in the literature. The data used are those for 2014.

- **The explanatory variable that collects inequality** of a country will be measured using the Gini coefficient, since this coefficient shows the level of income distribution. The coefficient is 0 if the income is distributed equitably amongst the entire population (perfect equality), while the coefficient is 1 when only one person has all the wealth (perfect inequality). The data used are those for 2014.

The **control variable** is:

- **Geographical area:** It is based on the assumption in this paper that the geographical area of each country of the sample has an impact on levels of corruption. Therefore, to collect the effect of this variable on the dependent variable four *dummies* are used to represent four types of geographical area where nearly all countries of the sample is included. The methodology was as follows: Firstly, the groups of countries to work with were selected with would work, and once defined these, countries of each group were selected that bear similarities between them, such as cultural, social, economic and policies; to thereby deal with homogeneous countries within each block. The defined groups representing the geographical area are:
    - Group of European countries: This block has not been represented by a *dummy* variable. Since are not as many created dummies as blocs of countries, therefore causing a lineal combination and the model would be irresolvable. For this reason, as many variables as blocks have been created minus one, in this case "***dummy Europe***" has been omitted.
    - Group of African countries (***dummy Africa***): It takes a value of 1 when it is an African country, and value of 0 when it is a non-African country.
    - Group of Asian countries (***dummy Asia***): It takes a value of 1 when it is an Asian country, and value of 0 when it is a non-Asian country.
    - Group of South American countries (***dummy South America***): It takes a value of 1 when it is a South American country, and value of 0 when it is not a South American country.
    - Group of other countries (***dummy other***): It takes a value of 1 for those countries that are not found in any of the above four groups, and value of 0 when it comes to countries that are already within the above groups. Countries that are part of this group, as discussed below are: Australia, USA and Canada.

Independent variables out of reach of empirical analysis of this paper due to lack of availability of data are the following:

- **The market regulation by the state.**
- **The salaries of civil servants.**
- **Quality of public administration.**
- **Citizen Political Participation.**

Table 1. Summary of variables and indicators.

Variable	Indicator	Minimum theorical	Maximum theorical	Source
Corruption	Perceptions Index Corruption (CPI) 2015	0 "the most corrupt"	100 "the least corrupt"	Transparency International (2016) http://transparencia.org.es/wp-content/uploads/2016/01/tabla_sintetica_ipc-2015.pdf
Transparency	Ranking of the right to information/ Ranking of transparency 2013	0 "the least transparent"	150 "the most transparent"	Datosmacro.com (2013) http://www.datosmacro.com/estado/indice-derecho-informacion
Political Stability	Index of Political Stability 2014	-2.5 "the least stable"	2.5 "the most stable"	TheGlobalEconomy (2014) http://es.theglobaleconomy.com/rankings/wb_political_stability/
Culture of illegality	Ranking of contract enforcement 2015	1 "the most legal"	189 "the least legal"	Doing Business (2015) http://espanol.doingbusiness.org/rankings
Education level	Index of the Enrolment in Secondary 2014	0%	<100%	World Bank (2016) http://datos.bancomundial.org/indicador/SE.SEC.ENRR

Foreing direct investment	% of GDP it represents in a country 2012, 2013, 2014	0%	100%	World Bank (2016) http://datos.bancomundial.org/indicador/BX.KLT.DINV.WD.GD.ZS
Tax burden	% of GDP it represents in a country 2014	0%	100%	World Bank (2016) http://datos.bancomundial.org/indicador/GC.TAX.TOTL.GD.ZS
Income level	GDP per capita (expressed in $ at current international prices) 2014	0	-	World Bank (2016) http://datos.bancomundial.org/indicador/NY.GDP.PCAP.PP.CD
Inequality	Gini coefficient 2014	0 "perfect equality"	1 "perfect inequality"	World Bank (2016) http://datos.bancomundial.org/indicador/SI.POV.GINI

Source: Prepared by author.

SAMPLE AND SELECTION PROCESS

The target population of study is composed by **41 countries around the world**, whose macroeconomic data are found in the sources described in the previous section. The main goal of countries selection is to create a representative sample, although it has been reduced to these countries, because only these countries are in possession of the complete information needed. Groups of countries, and countries that form are as follows:

- **European countries**: Germany, Belgium, Denmark, Spain, France, Greece, Italy, Netherlands, United Kingdom and Sweden.
- **African countries:** Algeria, Egypt, Ethiopia, Guinea, Kenya, Mali, Morocco and South Africa.
- **Asian countries:** China, Philippines, India, Indonesia, Israel, Japan, Pakistan, Russia, Thailand and Turkey.

- **South American countries**: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Uruguay.
- **Other countries**: Australia, Canada and USA.

In Annex A, the database is collected, it has been created for this exhibition, where all data variables and indicators appear.

DESCRIPTION OF THE MODEL

The model has been defined through a **logit regression**, since this type of regression is used to predict the result of a categorical variable, which is the case of the dependent variable of the model described in this paper, which represents the level of corruption in a particular country. For this reason, the dependent variable must be defined so to adopt a limited number of categories according to the independent variables. The categories of the dependent variable are determined by the ranking of "Perception Index Corruption", where countries are ordered from least to most corruption, where a value of 100 indicates the lowest level of corruption, and the value 0 indicates the highest level of corruption.

Based on the proposed hypotheses and variables defined above, it is possible to establish the following relationship:

$$\mathbf{CORRUP}_i = \beta_1 \mathbf{TRANS}_i + \beta_2 \mathbf{P.S}_i + \beta_3 \mathbf{C.I}_i + \beta_4 \mathbf{E.L}_i + \beta_5 \mathbf{F.D.I}_i + \beta_6 \mathbf{T.B}_i + \beta_7 \mathbf{INEQ}_i + \beta_8 \boldsymbol{dummy.AF}_i + \beta_9 \boldsymbol{dummy.AS}_i + \beta_{10} \boldsymbol{dummy.SA}_i + \beta_{11} \boldsymbol{dummy.O}_i + \mu_i$$

where **CORRUP** is the categorical dependent variable, **TRANS** is the independent variable representing transparency**, P.S** is the independent variable representing political stability, **C.I** is the independent variable representing the culture of illegality, **E.L** is the independent variable representing the education level, **F.D.I** is the independent variable representing foreign direct investment, **T.B** is the independent variable representing the tax burden, **INEQ** is the independent variable representing inequality; ***dummy.AF*** is the *dummy* variable that takes value 1 when it is an African country, ***dummy.AS*** is the *dummy* variable that takes value 1 when it is an Asian country, ***dummy.SA*** is the *dummy* variable that takes value 1 when it is a South American country**, *dummy.O*** is the *dummy* variable that takes value 1 if it is Australia, USA or Canada; and μ is the error term, which reflects the effect on the levels of corruption of all other variables not included in this model.

The test of multicollinearity of the variables has been important, as this is a severe problem, because it can increase the variance of the regression coefficients, making them unstable, and the consequences of this would be: On the one hand, the coefficients may appear insignificant even when there is a significant relationship between the explanatory variable and the dependent variable; and on the other hand, these same coefficients may have the wrong sign.

To test the multicollinearity a TEST VIF is used, to quantify the severity of multicollinearity in the analysis of the ordinary least squares regression (OLS), analysing the correlation structure of the explanatory variables and examining factors of variance inflation.

Finally, the variable representing the income level has not been included in the model because it shows multicollinearity problems, as it has a strong correlation with the other explanatory variables of this model. So, the hypothesis about the effect has income level on corruption level, could not be tested empirically.

The **material used** for the data analysis of this study was Stata, a statistical software.

RESULTS

DESCRIPTIVE ANALYSIS OF THE SAMPLE

This section will perform a descriptive analysis of the sample, in order to conveniently summarize the information contained in the database in which the empirical analysis of this paper is supported. This will allow to draw precise conclusions from data collected sample. Statisticians with whom will work this section are listed in Table 2, and these are: the mean, standard deviation, minimum, maximum and the median, of each of the variables with which it has been worked. It will then be discussed which are the most important of these.

Table 2. Descriptive statistics

Varible	Mean	S.D.	Min.	Median	Max.
Corruption	51.829	21.787	25	38	91
Transparency	64.22	38.568	0	70	128
Political stability	-0.16	0.931	-2.44	-0.08	1.23
Culture of illegality	78.098	54.269	1	59	180
Education level	0.964	0.266	0.36	0.99	1.63
Foreign direct investment	3.051	4.752	-3.13	1.7	23.4
Tax burden	19.073	7.556	9.2	16.5	37.2
Inequality	0.396	0.099	0.249	0.376	0.631

Source: Prepared by author.

Corruption: The five most corrupt countries of the sample, according to the Index of Perception of Corruption, are: Guinea, Kenya, Russia, Pakistan and Argentina. As they are the worst rated. While the five least corrupt countries in the sample are: Denmark, Sweden, Netherlands, Singapore and Canada.

Transparency: The five least transparent countries of the sample, according to the ranking of the right to information, are: Algeria, Egypt, Kenya, Mali and Morocco. While the five most transparent countries are: India, Mexico, Ethiopia, South Africa and Brazil. This may seem contradictory, because some countries that have been poorly rated in the Index of Corruption Perception, appear as the most transparent of the sample. But this is due to the transparency variable being collected from by the right to information, and this measures the strength of legislative framework to guarantee the right to information, but does not evaluate the correct application of the law. The conclusion that emerges from this information is that some countries could have a good legal framework which guarantees the right to information, but they may not be applying correctly their laws.

Political Stability: The five countries of the sample with more political stability are: Singapore, Canada, Australia, Sweden and the Netherlands. While the five countries with less political stability are: Pakistan, Mali, Egypt, Kenya and Ethiopia.

Culture of illegality: According to the index that has been used to measure this variable, the five countries of the sample that more contracts fail to comply are: Colombia, India, Indonesia, Egypt and Pakistan. While the five countries that less contracts fail to comply are: Singapore, Australia, Russia, China and Germany.

Educational level: To refer to the educational level the total students enrolled in secondary education is taken, expressed as a percentage of the total population in the official age to attend high school. The five countries of the sample that have more percentage of students enrolled are: Belgium, Australia, Netherlands, Spain and Denmark. While the five countries that have less percentage of students enrolled are: Ethiopia, Guinea, Pakistan, Mali and Kenya. As can be seen from Table 2, there is a large difference between the country that has more students, in this case Belgium, with the country that has less students, Ethiopia. This shows the existent inequality between countries in this area. In addition, the education level is represented by a quantitative index, not qualitative, since it does not measure the quality of education in the countries, and this has to be considered.

Foreign direct investment: The five countries of the sample that more foreign direct investment has in their economies are: Netherlands, Singapore, Chile, Uruguay and Peru. While the five countries that have less are: Belgium, Denmark, Japan, Sweden and Italy. As in the case of transparency, the data of this variable may seem a bit contradictory, because countries with better scores on political stability and corruption perception, have less foreign direct investment in their economy. But this can be

explained by strong speculation that has done in recent years in the economies of developing countries, for example Latin America. Therefore, three of these developing countries are among the top five economies in the sample that receive more foreign direct investment.

Tax burden: The five countries of the sample that support a higher tax burden are: Argentina, Algeria, Denmark, Guinea and Mexico. While the five countries that support a lower tax burden are: Ethiopia, China, India, Japan and Pakistan.

Inequality: According to the Gini coefficient, the five countries of the sample that have more level of inequality are: South Africa, China, Bolivia, Brazil and Colombia. While the five countries that have less level of inequality are: Sweden, Netherlands, Belgium, Denmark and Germany.

ANALYSIS REGRESSION MODEL

This section will perform the analysis of the regression model. The results of the model estimation are listed in Table 3, which shows: the estimated coefficient for each of the explanatory variables, the expected sign of the coefficient according to the approach of the hypothesis, the standard error and the p- value, besides the Chi^2 and R^2. Below, the results will be discussed and interpreted, in order to empirically test the hypothesis.

Table 3. Regression of the relationship between corruption and macroeconomic factors.

Dependent variable: Level of corruption				
Independent Variables	Expect sign	Coef.	Std. Err.	P-value
Transparency	+	0.018**	0.008	0.037
Political Stability	+	2.062***	0.637	0.001
Culture of illegality	-	-0.001	0.007	0.891
Education Level	+	3.118	2.088	0.135
Foreing Direct Investment	+	0.158**	0.078	0.043
Tax burden	-	0.008	0.053	0.878
Inequality	-	-3.848	4.017	0.338
Dummy Africa		-0.774	1.43	0.588
Dummy Asia		-0.219	1.483	0.853
Dummy South America		-2.681*	1.393	0.054
Dummy Other		0.188	1.241	0.88
Number of obs.= 41				
Chi^2= 61.79		* Level of significance of 0.1		
Prob > Chi^2= 0.000		** Level of significance of 0.05		
R^2= 0.239		*** Level of significance of 0.01		

Source: Prepared by author.

The statistical significance of the model has been determinate by Chi^2. The null hypothesis claims that coefficients of all the variables included in the model are equal to 0. However, the alternative hypothesis claims that coefficients are significantly different from 0. If the probability of Chi^2 associated to the value of the test was less than 0.05, the null hypothesis would have to be rejected. The p-value of the Chi^2 is less than 0.05, it is concluded that the model is significant at the 0.1% level. The null hypothesis is rejected, so that the adequacy of the equation is accepted to explain the level of corruption in a country.

In addition, R^2 is also used to determine the goodness of fit. It measures the explanatory capacity of the model. The results indicate that the independent variables included in the model explained the 23.9% of the behaviour of the dependent variable, level of corruption.

Then the statistical significance of each explanatory variable is determined:

- **Transparency:** The sign of its coefficient is positive, so when the level of transparency of a country increases, the score in perception levels of corruption also increases. That means the country is less corrupt. The p-value is 0.037, so this variable is significant at the 5% level.

  The hypothesis for this variable is: a higher level of transparency in a country will be associated with a lower level of corruption in this country. The sign of the coefficient has been as expected, and empirical analysis has shown the significance of this variable, so the hypothesis is tested and is not rejected.
- **Political Stability:** The sign of its coefficient is positive, so when political stability of a country increases, the score in perception levels of corruption also increases. That means the country is less corrupt. The p-value is 0.001, so this variable is significant at the 5% level.

  The hypothesis for this variable is: a greater political stability in a country will be associated with a lower level of corruption in this country. The sign of the coefficient has been as expected, and empirical analysis has shown the significance of this variable, so the hypothesis is tested and is not rejected.
- **Culture of illegality:** The sign of its coefficient is negative, so when the culture of illegality of a country (breach of contracts) increases, the score in perception levels of corruption decreases. That means the country is more corrupt. The p-value is 0.891, so this variable is not significant because it is above the level of significance of 10%.

The hypothesis for this variable is: a greater culture of illegality in a country will be associated with a higher level of corruption in this country. The sign of the coefficient has been as expected, but the results of the empirical analysis have not shown the significance of this variable, so this is statistically irrelevant and the hypothesis is not fulfilled and is rejected.

- **Education level:** The sign of its coefficient is positive, so when the level of education of a country increases in levels, the score in perception levels of corruption also increases. That means the country is less corrupt. The p-value is 0.135, so this variable is not significant because it is above the level of significance of 10%.

  The hypothesis for this variable is: a higher level of education in a country will be associated with a lower level of corruption in this country. The sign of the coefficient has been as expected, but the results of the empirical analysis have not shown the significance of this variable, so this is statistically irrelevant and the hypothesis is not fulfilled and is rejected.
- **Foreign direct investment:** The sign of its coefficient is positive, so when foreign direct investment of a country increases, the score in perception levels of corruption also increases. That means the country is less corrupt. The p-value is 0.043, so this variable is significant at the 5% level.

  The hypothesis for this variable is: a greater foreign direct investment present in a country will be associated with a lower level of corruption in this country. The sign of the coefficient has been as expected, and empirical analysis has shown the significance of this variable, so the hypothesis is tested and is not rejected.
- **Tax burden**: The sign of its coefficient is positive, so when the tax burden of a country increases, the score in perception levels of corruption also increases. That means the country is less corrupt. The p-value is 0.878, so this variable is not significant because it is above the level of significance of 10%.

  The hypothesis for this variable is: a higher tax burden in a country will be associated with a higher level of corruption in this country. The sign of the coefficient has not been as expected, as it shows the opposite of the hypothesis to be tested. In addition, the results of the empirical analysis have not shown the significance of this variable, so this is statistically irrelevant and the hypothesis is not fulfilled and is rejected.
- **Inequality**: The sign of its coefficient is negative, so when inequality of a country increases, the score in perception levels of corruption decreases. That means the country is more corrupt. The p-value is 0.338, so this variable is not significant because it is above the level of significance of 10%.

The hypothesis for this variable is: a greater inequality in a country will be associated with a higher level of corruption in this country. The sign of the coefficient has been as expected, but the results of the empirical analysis have not shown the significance of this variable, so this is statistically irrelevant and the hypothesis is not fulfilled and is rejected.

- ***Dummies* reflecting the effect of the geographical area** on the levels of corruption: The four coefficients of *dummies* have a negative sign. So, when these variables take a value of 1, the scores in perception levels of corruption decreases. That means the country is more corrupt, regarding the omitted *dummy* of Europe. However, analysing the p-value, only the *dummy* representing the South American countries has a significant effect on levels of corruption, as its p-values is 0.054, which is significant at the 5% level.

The results of this study show that there is empirical evidence to assert that there is a direct relationship between transparency, political stability and foreign direct investment on the levels of corruption.

On the one side, countries that use more efficient mechanisms of accountability with their citizens will be less exposed to corruption, because the branches of government will be more controlled by citizens and this will prevent the implementation of unlawful acts. These results are in tune with some mentioned studies in the review of literature, such as Prats (2008) and Kaufmann (2000).

On the other side, countries with greater political stability, are less exposed to corruption, as demonstrated by the empirical analysis. Because, as suggested by Bigio and Ramirez-Rodan (2006), in a context of political stability, both the public and private actors of a country will have less tolerance for corrupt actions, since these could seriously damage the stability of that country.

Finally, this research also shows that the weight of foreign direct investment in one country has an impact on levels of corruption. As the empirical review of Bigio and Ramirez-Rodan (2006) suggests, this variable is strongly related to the confidence of investors in the countries where they want to invest. Since, countries with more foreign direct investment are going to commit fewer corrupt acts to avoid damaging the confidence of foreign investors.

CONCLUSIONS AND DISCUSSION

Corruption is an important problem that is prevalent to a lesser or greater extent at a global scale, there is not a single country that is not exposed to it. Corruption has always existed. However, in the last few years, corruption has become an issue of great media interest and of great significance, because of large media diffusion of such a topic.

The corrupt actions have a negative impact on the civic, private and public sectors in each State. Because it undermines the legitimacy of public institutions, strikes at society, moral order, harmony, justice and the comprehensive development of populations. Therefore, the fight against it has become the target of agencies and institutions, including Transparency International, a non-governmental organization on a universal scale entirely dedicated to fighting corruption. It works by promoting greater transparency and the realization of the measures of accountability.

For these reasons, combating corruption has become the aim instead of repairing the damage caused by it, because using preventative measures could reduce levels of corruption, until it is totally eliminated at some point in the future. Therefore, this paper has reviewed the existing literature, which has revealed what could be the macroeconomic factors that could be affecting negatively or positively the levels of corruption.

This paper has made an econometric analysis providing empirical evidence of which macroeconomic factors affect significantly the levels of corruption. To this end, it has created a database with several dependent variables represented by indicators, and a sample that has been drawn from 41 countries worldwide.

The results of the econometric analysis have shown that transparency, political stability and foreign direct investment are factors that have a direct relationship with the level of corruption. These three variables reduce the levels of corruption in countries. Consequently, States that promote policies and measures to increase transparency, political stability and the inflow of foreign direct investment, will experience lower levels of corruption.

This analysis presents some limitations that could lead to future research. For example, the sample has been reduced to 41 countries because only these possessed all complete data. Moreover, there were factors identified by various authors which have not been included in the analysis, due to the lack of data in some of the countries that form the sample, these have been: market regulation by the State, salaries of civil servants, quality of public administration and citizen political participation. In addition,

future research could focus on other indexes that have not been available to this research, to measure the effectiveness or quality of the variables under study, and not quantity. For instance, the education and transparency have been represented by quantitative variables; transparency is collected in this work by the ranking of the right to information, but does not evaluate the correct application of the law.

LIST OF REFERENCES

- Alcaide, A. & Larrú, J.M. (2007) 'Corrupción, ayuda al desarrollo, pobreza y desarrollo humano'. *Boletín económico de ICE, Información Comercial Española, (2917), 37-58.*
- Bengovic, B. (2005). 'Corrupción: Conceptos, Tipos, Causas y Consecuencias'. *Centro para la apertura y el desarrollo de América Latina, 26.*
- Bigio, S. y Ramírez-Rondán, N. (2006). 'Corrupción e Indicadores de Desarrollo: Una Revisión Empírica'. *Banco Central de Reserva del Perú, Perú*.
- Datosmacho.com (2013) *Índice del Derecho a la Información 2013* [online] available from <http://www.datosmacro.com/estado/indice-derecho-informacion> [20 March 2016]
- Doing Business (2015) *Clasificación de las Economías* [online] available from <http://espanol.doingbusiness.org/rankings> [20 March 2016]
- El Banco Mundial (2016*) Inscripción Escolar, nivel secundario (% bruto)* [online] available form <http://datos.bancomundial.org/indicador/SE.SEC.ENRR> [20 March 2016]
- El Banco Mundial (2016) *Inversión extranjera directa, entrada neta de capital (% del PIB)* [online] available from <http://datos.bancomundial.org/indicador/BX.KLT.DINV.WD.GD.ZS> [20 March 2016]
- El Banco Mundial (2016) *Recaudación impositiva (% del PIB)* [online] available from <http://datos.bancomundial.org/indicador/GC.TAX.TOTL.GD.ZS> [20 March 2016]
- El Banco Mundial (2016) *PIB per cápita, PPA ($ a precios internacionales actuales)* [online] available from <http://datos.bancomundial.org/indicador/NY.GDP.PCAP.PP.CD> [20 March 2016]
- El Banco Mundial (2016) *Índice de Gini* [online] available from <http://datos.bancomundial.org/indicador/SI.POV.GINI> [20 March 2016]
- Kaufmann, D. (2000). 'Corrupción y reforma institucional: el poder de la evidencia empírica'. *Revista Perspectivas (Departamento de Ingeniería Industrial, Universidad de Chile), 3(2), 367-387.*
- La Porta, F. y Alvarez, S. (1997) *La corrupción política*. Madrid: Alianza Editorial.

- Mauro, P. (1995) 'Corruption and Growth'. *The Quarterly Journal of Economics* [online] August. Available from <http://www.jstor.org/stable/pdf/2946696.pdf?acceptTC=true> [3 February 2016]
- Mény, Y. (1996). 'Política, corrupción y democracia'. Política y gobierno, 3(1), 155-171.
- Moreno, W. L., & Ríos, J. A. S. (2012, May). 'El triángulo del fraude'. In Forum Empresarial (Vol. 17, No. 1, pp. 65-81). *Centro de Investigaciones Comerciales e Iniciativas Académicas*
- Prats, J.O. (2008) 'Causas Políticas y Consecuencias Sociales de la Corrupción'. Papers: *Revista de Sociología, 2008, nº88, p.153-164.*
- Soto, R. (2003) *La corrupción desde una perspectiva económica* [online] available from <https://www.researchgate.net/profile/Raimundo_Soto/publication/5128681_La_Corrupcin_desde_una_Perspectiva_Econmica/links/0912f50a3499d9322e000000.pdf> [3 February 2016]
- The Global Economy (2014) *Índice de Estabilidad Política* [online] available from <http://es.theglobaleconomy.com/rankings/wb_political_stability/> [20 March 2016]
- Transparency International (2015) *Índice de Percepción de la Corrupción 2015 de Transparency International* [online] available from <http://transparencia.org.es/wp-content/uploads/2016/01/tabla_sintetica_ipc-2015.pdf> [2 February 2016]

ANNEXES

ANNEX A. DATABASE

Sample countries	Corruption	Transparency	Political Stability	Culture of legality	Education Level	Foreing Direct Investment
Germany	81	52	0,93	12	102,00%	1,1
Belgium	77	59	0,71	53	163,00%	-3,13
Denmark	91	64	0,94	37	130,00%	0,13
Spain	58	76	0,32	39	131,00%	2,57
France	70	64	0,36	14	111,00%	1
Greece	46	65	0,02	132	108,00%	0,87
Italy	44	57	0,5	111	102,00%	0,5
Netherlands	87	82	1,05	91	131,00%	23,4
United Kingdom	81	99	0,44	33	124,00%	1,53
Sweden	89	92	1,07	24	128,00%	0,17
Algeria	36	0	-1,17	106	100,00%	0,73
Egypt	36	0	1,28	155	86,00%	1,37
Ethiopia	33	112	-1,24	84	36,00%	1,6
Guinea	25	64	-0,93	118	39,00%	2,87
Kenya	25	0	-1,27	102	68,00%	0,83
Mali	35	0	-1,74	149	44,00%	2,77
Morocco	36	0	-0,39	59	69,00%	3,1
South Africa	44	109	-0,08	119	98,00%	1,67
China	37	70	-0,46	7	96,00%	2,93
Philippines	35	0	-0,7	140	88,00%	1,63
India	38	128	-0,96	178	69,00%	1,5
Indonesia	36	101	-0,37	170	82,00%	2,63
Israel	61	66	-0,99	77	102,00%	3,27
Japan	75	65	1,02	51	102,00%	0,13
Pakistan	30	66	-2,44	151	42,00%	0,57
Russia	29	0	-0,84	5	99,00%	2,33
Singapore	85	0	1,23	1	95,90%	20,93
Thailand	38	76	-0,91	57	86,00%	2,63
Turkey	42	72	-1,06	36	115,00%	1,2
Argentina	32	66	0,08	38	106,00%	1,7
Bolivia	34	0	-0,36	136	85,00%	3,27
Brazil	37	108	-0,01	45	95,22%	3,47
Chile	70	93	0,49	56	100,00%	8,73
Colombia	37	102	-1,12	180	90,10%	4,23
Ecuador	32	73	-0,01	148	104,00%	0,73
Mexico	35	117	-0,76	41	87,00%	2,37
Peru	36	93	-0,52	69	96,00%	4,9
Uruguay	74	91	1	104	99,80%	5,07
Australia	79	83	1,08	4	138,00%	3,47
Canada	83	79	1,18	49	110,00%	3,03
USA	76	89	0,62	21	96,00%	1,3

Sample countries	Tax burden	GDP per capita	Inequality	Dummy Africa	Dummy Asia	Dummy South America	Dummy Other
Germany	11,6	45.830,42	0,283	0	0	0	0
Belgium	25,5	46.595,98	0,266	0	0	0	0
Denmark	35,1	59.869,30	0,281	0	0	0	0
Spain	13,9	29.893,08	0,35	0	0	0	0
France	15,6	42.502,82	0,305	0	0	0	0
Greece	22,8	22.918,20	0,343	0	0	0	0
Italy	23,6	35.963,28	0,319	0	0	0	0
Netherlands	20	51.643,95	0,254	0	0	0	0
United Kingdom	25,4	42.726,70	0,328	0	0	0	0
Sweden	26,3	58.977,48	0,249	0	0	0	0
Algeria	37,2	5.501,68	0,353	1	0	0	0
Egypt	12,5	3.168,25	0,308	1	0	0	0
Ethiopia	9,2	475,73	0,336	1	0	0	0
Guinea	31,9	499,05	0,394	1	0	0	0
Kenya	15,9	1.203,33	0,477	1	0	0	0
Mali	15,8	671,65	0,33	1	0	0	0
Morocco	23,9	3.086,10	0,409	1	0	0	0
South Africa	25,5	7.261,70	0,631	1	0	0	0
China	10,4	6.605,18	0,614	0	1	0	0
Philippines	12,9	2.659,03	0,43	0	1	0	0
India	10,8	1.489,50	0,339	0	1	0	0
Indonesia	11,4	3.615,88	0,34	0	1	0	0
Israel	22,9	35.003,40	0,392	0	1	0	0
Japan	10,9	41.927,78	0,376	0	1	0	0
Pakistan	11,2	1.272,30	0,3	0	1	0	0
Russia	14,3	13.656,28	0,42	0	1	0	0
Singapore	13,8	54.990,68	0,473	0	1	0	0
Thailand	17,3	5.916,00	0,394	0	1	0	0
Turkey	21,4	10.680,08	0,448	0	1	0	0
Argentina	37,2	13.675,72	0,366	0	0	1	0
Bolivia	27	2.773,76	0,563	0	0	1	0
Brazil	14,1	12.248,75	0,547	0	0	1	0
Chile	17,5	15.026,38	0,521	0	0	1	0
Colombia	13,4	7.761,20	0,535	0	0	1	0
Ecuador	13,2	5.830,75	0,493	0	0	1	0
Mexico	29,7	9.979,20	0,472	0	0	1	0
Peru	16,5	6.316,23	0,481	0	0	1	0
Uruguay	18,8	15.745,13	0,413	0	0	1	0
Australia	22,2	64.873,80	0,305	0	0	0	1
Canada	11,7	51.841,38	0,321	0	0	0	1
USA	11,7	52.211,90	0,469	0	0	0	1